

US-PAT-NO: 6037734

DOCUMENT-IDENTIFIER: US 6037734 A

TITLE: Motor velocity controlling method employing detection of all side edges of phase signals of an encoder to generate control target values for updating a motor control command

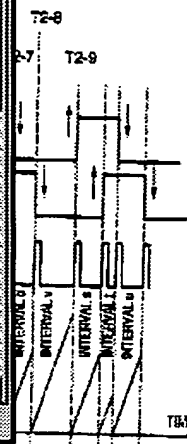
----- KWIC -----

Detailed Description Text - DETX (12):

The image scanner changes the moving speed of the carriage 20 in accordance with the specified resolution decided on PC, and reads out the image.

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62 US 6104864 A

63 US 6065036 A

64 US 6037734 A

65 US 5995137 A

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PAT-NO: JP361290880A

DOCUMENT-IDENTIFIER: JP 61290880 A

TITLE: IMAGE DECIDING DEVICE

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Abstract Text - FPAR (1):

PURPOSE: To execute quickly deciding work, and also to cope immediately with a moving object whose moving speed is different, by providing a line sensor camera, a scanning speed switching means, the first and the second converting means, a storage means, a selecting means, a read-out means, and a display means.

特許出願分類
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202 JP 63067863 A

203 JP 62160469 A

204 JP 61290880 A

205 JP 59005236 A

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US-PAT-NO: 5182450

DOCUMENT-IDENTIFIER: US 5182450 A

TITLE: Handheld image scanner with automatic move

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Detailed Description Text - DETX (12):

When movement of the handheld image scanner is automatic control switch (30) is first placed in the ON position, and the switch (32) is operated to select the desired degree of resolution. At the same time, the switch (32) connects the motor (13) to one of the output ports of the divider circuit means (33) to provide to the motor (13) the required voltage corresponding to the desired degree of resolution. This provides how the preferred scanning speed for a desired degree of resolution is obtained when automatically moving the image scanner.

Details Text Image HTML KWIC

108 US 5204736 A

109 US 5202675 A

110 US 5182450 A

111 US 5175570 A

HANDHELD IMAGE SCANNER WITH AUTOMATIC MOVEMENT CONTROL

BACKGROUND OF THE INVENTION

1. Field of the Invention
The invention relates to a handheld image scanner, more particularly to a handheld image scanner, the scanning movement of which may be manually or automatically controlled.

Description of the Related Art

FIG. 1 is a block diagram illustrating an image scanner when it is used. Digital data signals from the image scanner (3) are sent to a computer (2) via an interface device (1). The interface device (1) usually employs a direct memory access (DMA) method to receive the digital data signals from the image scanner (3). Data from the interface device (1) is then received by the computer (2) for eventual display on a monitor device (not shown) or for storage in a hard disk. Referring to FIG. 2, it is a conventional handheld image scanner (3) is shown to comprise a light source (4) such as a light emitting diode (LED) array or a cold cathode fluorescent lamp, a horizontal line scanning means including a mirror (5) which is rotated at a 45° angle and a lens and image sensor (6), a transverse distance separating means including a roller (7), a transverse motor (8), and a digital generating means including a preferred rotary plate (9) and a photoconductor and sensing means (10), a heliograph control loop (11), and the associated variable resistance, printed circuit board and housing.

When the conventional handheld image scanner (3) is in use, the light source (4) emits light so as to illuminate a portion of an image being scanned. Various light signals are generated according to the different points on the image. The light signals are transmitted to the roller (5) inside the housing and are deflected upwards by the roller (5) and image sensor (6) to thereby produce an electric signal which is sent to the interface of the light signal received. The image sensor has a plurality of light sensitive elements and is capable of scanning at a resolution greater than 100 dots per inch (dpi).

The image sensor can take only one horizontal line of predetermined dimension at one time. Then, the handheld image scanner (3) must be moved in a transverse direction so as to scan the succeeding lines.

Referring to FIG. 4, the roller (5) rolls along the surface of the image being scanned when the roller (5) drives the transverse motor (8) to successively rotate the rotary plate (9). The rotary plate (9) is formed with a series of radially extending notches. The photoconductor and sensing means (10) includes a Colpitts tank circuit, a light emitting means (not shown) mounted on an inner side of the Colpitts tank and a photoconductor (not shown) mounted opposite to the light emitting means. The rotary plate (9) extends into an opening in the Colpitts tank between the light emitting means and the photoconductor. The photoconductor and sensing means (10) can thus produce a series of ON/OFF signals whenever the rotary plate (9) is in motion. The ON/OFF signals are received by the computer (2) and are indicative of the features represented by the image scanner (3). Manual movement of the conventional image scanner (3) is a transverse direction relative to the image to be scanned.

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1. Manually hand movement and digital method movement of the image scanner (3) are used to control the scanning speed. The scanning speed is controlled by the lens and image sensor (6).
2. Different degrees of resolution require different scanning speeds. A table of resolution (in dpi) versus the preferred scanning speed (in inches per second) is shown below. Data is obtained under the condition of each dpi being exposed to light for a period of 1.57 milliseconds.

Resolution	10	20	30	40	50	60
Scanning Speed	1.2	2.4	3.6	4.8	6.0	7.2

It is difficult to obtain the preferred scanning speed for a desired degree of resolution when movement of the image scanner (3) is manually controlled. Note that high degrees of resolution require low scanning speeds. However, usually hand movement is difficult to obtain at such low speeds. Furthermore, no useful information can be obtained when the hand moves at a speed much faster than the preferred scanning speed. 1. When a large volume of image data is available, the capacity of the computer (2) is immediately filled and further data from the scanner is not recorded in the memory unit. Data in the memory unit should be first transferred to a hard disk so as to permit the computer (2) to receive additional scan data. However, since the manual scanning action is continuously performed, it is possible that some scan data will be lost while the computer (2) transfers data to the hard disk.

SUMMARY OF THE INVENTION

Therefore, the objective of the present invention is to provide an improved handheld image scanner, the movement of which can be automatically controlled so as to overcome the above-mentioned drawbacks commonly associated with the prior art.

More specifically, the main objective of the present invention is to provide a handheld image scanner, the movement of which can be automatically controlled so as to provide transverse movement of the scanner at the preferred scanning speed for a desired degree of resolution, and so as to overcome the adverse effects caused by manually hand movement.

Another objective of the present invention is to provide a handheld image scanner which scans scanning when the memory unit of a computer is full and which resumes scanning only when the memory unit is clear to receive more data.

Accordingly, the preferred embodiment of a handheld image scanner of the present invention comprises a housing; a light source mounted to a bottom side of the housing for emitting light to illuminate an image being scanned; a horizontal line scanning means provided inside the housing and including a transverse motor to receive light signals which correspond to a transverse horizontal line portion of the image. The transverse motor generates an electric signal which varies according to the intensity of light signals received; a transverse distance separating means including a roller (5) which rolls along the surface of the image when the image scanner is moved in a transverse movement to the horizontal transverse line portion; a photoconductor and sensing means provided inside the housing and capable of being repeatedly driven by the roller (5) and a digital generating means activated by the transverse motor so as to generate a series of ON/OFF signals

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